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MEDICAL INSPECTION OF SCHOOLS

ADDRESS OF DR. HIRAM BIRD
Chairman Committee on Public Health and Sanitation

BEFORE THE STATE CONFERENCE OF WOMEN'S CLUBS, AT JACKSONVILLE, FLA., NOV. 14, 1911

STATE BOARD OF HEALTH OF FLORIDA

1912
E. O. PAINTER PRINTING CO.
DE LAND, FLA.

12-33462

PUBLICATION 96 JUNE, 1912

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By Dr. Hiram Byrd.

Ladies and Gentlemen:

At a meeting of this kind, held two hundred years ago, we would have discussed mischievous sprites and elves and witches, as the cause of disease; and incantations, sorcery, and ceremonies as the remedies. We would have heard that Sir Kenelm Digby's sympathetic applied to the sword, would heal the wounded soldier; we would have heard that four or six big fat snakes put in a gallon of canary wine alive and left four to six months would make a medicine that would provoke to love and cure the small-pox; and a little later we would have heard that a certain German-American Doctor by the name of Cagliostro had discovered the truly elixir of life, that would change all metals into gold and keep people forever young.

In the days of the celebrated Divine, Cotton Mather, if we had had a meeting of this kind, every homely and eccentric old woman in the community would have been discussed, and dissected, and condemned and tortured into confession of witchcraft, and then burned at the stake because she had confessed.

Just one hundred and two years have now elapsed since the birth of the man who was destined to usher in a new era in learning—an era which was to abolish dogmatism and institute experiment; an era that was to ignore opinion however venerable with age it might be, and accept nothing but proof; an era that was to subject every item in the domain of human knowledge to the most exacting test that science could devise, and reject every particle that could not stand the test.

But while Darwin ushered in this new era, by rejecting the dogmas with which the world was teeming, and by inductive reasoning set up new standards of truth, and opened the way for the scientific study of biology, and himself coined the expression, "The strugle for existence," which is the nucleus around which all biological phenomena group themselves, he did not understand its full significance. He saw some three thousand species of animals, and some two hundred and fifty thousand species of plants all turned loose in the world together, all struggling with adverse conditions to maintain their own existence; plants struggling with

one another for soil, light, warmth, moisture; animals struggling with one another for food, place, supremacy; plants struggling with animals to keep from being eaten, animals struggling with plants to make them available for food; every one for self, having no care except to get all possible and turn it to its own account, and no fear except the fear of being used for food or otherwise consumed by some stronger, some more ingenious appetite.

And in that fierce struggle, how many animals, how many plants, must daily, hourly perish. How many blades of grass to feed a single caterpillar! How many caterpillars to feed a sparrow! How many beetles for a toad! How many toads for an adder! How many sparrows, toads, adders, to feed a single hawk!

Darwin saw in the struggle for existence, that slow but constant change that makes for new varieties, as the farmer by careful propagation can produce different varieties of corn, as the Cuban, the shoe peg, the Blitch; as the stock man by systematic breeding can produce from common cattle, the Hereford, the Shorthorn, the Jersey. And as the propagation continued through the ages he saw the difference become greater and greater, the varieties diverge into species, as the dog, the wolf, the coyote, that came from a common ancestor; and he saw species diverge into genera, and on up through the scale—the struggle for existence weeding out the weaker, the survival of the fittest propagating the kind.

But while Darwin saw all this in the world of larger things, he never followed it into the domain of disease. That work was reserved for another. Where Darwin laid it down, his illustrious contemporary, Pasteur took it up, and demonstrated for the first time in the history of the world that what we know as disease, is nothing more or less than the phenomena of the struggle for existence; that the struggle is not confined to the higher animals or higher plants, but penetrates every part of the organic world, from the lion making food of the buffalo to the malarial parasite making food of the human blood; from the mistletoe penetrating the oak with its roots to the tubercle bacillus penetrating the human lungs. Darwin's observations had been confined to the world visible; Pasteur's keen mind took it on into the world invisible. And here he saw the struggle just as fierce as in the world of larger things. Saw that sickness is an accident—the result of

some smaller animal or plant trying to make a living, trying to get food and shelter—may be some coarse parasite, as the tapeworm in the intestine of the cow, or some smaller one, as the hookworm sucking the blood of the child, or it may be some still smaller worm as the trachina that embeds itself in the muscle of the pig and causes measly pork, or indeed the attacking parasite may even be too small to be seen without a microscope, as the malarial parasite in the human blood, or the tubercle bacillus in the lungs. Size makes no difference—the struggle is none the less fierce because one of the combatants happens to be microscopic in size. The objects of the combat are the same—the result the same as in the higher world.

I say it was Pasteur that extended our knowledge of biology into the lower world. He could not see it in all its fullness and richness at that early time, for he was the first to look. Much long and patient labor was to be performed before the basic principles were to be laid bare. Pasteur did much of the work himself, and showed how it could be done, and as if his call in behalf of humanity had been magic, a thousand laborers instantly responded and soon the dyke of ignorance and superstition that held the people in thrall since the beginning of the world, was broken and a flood of knowledge like a mighty torrent came rushing through, and sweeping on and on. Thought once awakened does not slumber again. It grows in man after man, generation after generation. And ever as it grows it becoms more and more democratic. At first only seen by the seers, truth at length becomes a household word, and little children see more danger in the house fly today,

"Than ever the sages
Of the earlier ages saw."

So prompt was the response to his call that even during his life time, Pasteur saw that knowledge working like the ferment that he had discovered throughout the length and breadth of the land. First, physicians taking advantage of the fact that disease is a living process in the interest of their patients; then sanitarians taking advantage of it to prevent disease; and then everybody from one end of the earth to the other, waking from their lethargy and joining in the mad rush for less disease, better health, and more happiness. Witness the hundred and one or-

ganizations for the study and prevention of tuberculosis alone, the endowments for tuberculosis hospitals, the dispensaries, the prizes, the legislation, the international meetings, that this disease alone has called into existence! And then reflect that tuberculosis has not received more than its proportionate share of the study that has been done on the other major maladies that afflict mankind. That diphtheria, malaria, typhoid, cholera, plague, smallpox, pellagra, hookworm, infantile paralysis, have all been accorded attention according to their importance.

Early in the study of these several diseases, it was discerned that none of them could be successfully coped with except by intelligence—an intelligence of the highest order. That malaria was both a scourge and an enigma as long as the life struggle between the malarial parasite and its host was unknown—as long as it was unknown how the parasite managed to pass from host to host. The first successful management of malaria was after it was discovered that the mosquito serves as intermediate host for the parasite.

To combat disease successfully means that not only the physicians and health officers must have adequate knowledge of its cause and method of transmission, but that the entire population must likewise know the inmost secrets of the same that they might give their intelligent co-operation. Or to state it another way, we are engaged with our microscopic foes in a hand to hand struggle for existence—and whether we will better our condition, or be the easy prey that we have always been, depends upon whether we will enlist intelligence on our side. To state it still another way, public health is a matter of public education. And oh, that is such a tedious—such an eternal undertaking! To educate the public. To bring the rank and file to an appreciation of the things that we think are worth while! That is work, that is labor. For a hundred years we have known how to prevent smallpox, and yet nearly a hundred thousand people in the United States had the disease last year! For fifteen years we have known that malaria was transmitted solely by mosquitoes and yet some of our school physiologies even of to-day state that the disease may come from miasmatic effluvia—whatever that is. For fifteen years we have been harping on the life of the mosquito as a factor in the spread of malaria, and more recently of yellow fever, and how the insect breeds only in water, and yet we hear spasmodic

spurts and sputtering about the negligence of the health authorities because of weeds that are alleged to be breeding mosquitoes! Oh what a task when we undertake to educate the public.

So hopeless is it that it is now being recognized more and more that the point of attack must be the child and not the parent. That the place to educate the child is the public school. That it will take an army of educators, and these we have in the teachers of the country. That education along public health lines is only a part of the work of educating the child for its future usefulness and happiness.

When Pasteur made his famous discovery that the diseases of silkworm, known as pebrine and flacherie, were due to parasites, and were preventable, and then in rapid succession discovered the cause and method of prevention of chicken cholera, and anthrax, and swine erysipelas—discovered that they were all parasitic diseases, the world stood aghast and wondered. These new doctrines were so different from the things they had heard, that they were dazzled. Suddenly one, and then another caught the spirit—saw the light, and soon a thousand workers sprang through the gate he had opened, some to learn more of the new science, and some to pass the learning around that more and more might profit by the treasures that he had garnered. And round and round it was passed till the children were reached, and even in the life of that venerable sage, medical inspection of schools was established on the very spot where two centuries before the witches were burned. And from that small beginning in Boston seventeen years ago, the movement has spread to over a thousand cities in America, has spread to Canada, England, Scotland, Germany, even far Australia, and in some form or other has found anchorage in every enlightened nation on earth.

Wherever medical inspection of schools has been instituted, regardless of size of city, or amount of expenditure, regardless of the agencies employed in its execution, one thing has always figured as one of the first objects to be attained; namely the prevention of communicable disease. Other things vary in different locations but that is universal.

It must not be assumed for an instant though, that the methods employed for this are the same. They vary greatly. Just so the diseases to be prevented vary. Each country has its own public health problems. The far east has among its major problems,

plague and cholera. The West Indies, and tropical America has as its major problem, yellow fever. Africa has among the more important diseases sleeping sickness. The larger cities of the world are more infested with vermin and skin diseases; the country, with sewage-borne diseases.

And even the public problems of the same locality vary from year to year, from decade to decade. One year we will have an abundance of one communicable disease and another year another. One year we may have more diphtheria, another year more scarlatina, another more measles, or whooping cough.

Prior to 1898 plague was unknown in the United States. Then it got introduced into San Francisco and has been like a mine under the place ever since, while the eastern states have still enjoyed freedom from it.

If we of Florida had been discussing our major diseases twenty years ago, yellow fever would have had the foremost place, while to-day it would hardly get a passing mention, but we would hear of a new and fatal disease of rapidly increasing prevalence, known as pellagra. Ten years ago we would not have heard mentioned the hookworm, while to-day it stands in the scale of importance second to none.

So it is patent that all effort to prevent communicable disease must crystallize in accordance with the needs of the community.

The second object to be attained is the correction of physical defects. In the Borough of Manhattan, New York, 275,000 school children were examined and the astonishing fact revealed that something over 71 per cent. needed medical treatment in some form or other. 49 per cent. had defective teeth. We are not surprised then to find that 45 per cent. had diseased glands, 27 per cent. had enlarged tonsils, 16 per cent. had nasal growths, 15 per cent. had obstructed breathing, one out of five children had defective vision.

It is not likely that we have the same physical defects in this state to the same degree. In Ocala last year it was found that one out of eleven had defective vision, instead of one out of five. But, on the other hand, we have other defects just as serious to take their place. Indeed, we have a disease, common to tropical countries, quite as prevalent, and vastly more important, than any of those named. A disease that I hesitate much to discuss in this connection, because it has been in the lime light so long, but its

pre-eminent position in the scale of serious maladies will not permit us to pass it lightly by.

Let us pause here long enough to see if we can get the full import of this one disease.

White people suffer from it more than negroes.

Children suffer from it more than adults.

The rural population suffers from it more than the urban.

Our inquiry will be then to determine the cost in dollars and cents that hookworm disease entails upon our rural white children.

55 per cent. of our people are white. 70 per cent. of our people live in the country. Therefore 28 per cent. of our white school children live in the country.

A canvass was made by the State Board of Health covering six thousand rural school children and it was found that 52 per cent. of them were hookworm sufferers.

From which it is seen that 15 per cent. of the total school children of the state are suffering from hookworms.

The extent to which the sufferer's vitality is lowered varies. But it can be measured with a fair degree of accuracy by the color of the blood. That is to say, rich, healthy deep red blood is indexed at 100. The hookworm sufferer's blood becomes pale and watery in proportion to his infection. And as the infection gets worse and worse the color index of the blood runs down and down, 90, 80, 60, and even to 20 per cent. of the normal. Perhaps an average color would be 70 per cent. But, to be especially conservative, we will assume that it is not so low as that. We will assume that it is 80 per cent. That means that the sufferer is off 20 per cent. in strength, 20 per cent. in intellectual energy, 20 per cent. in power of learning.

Now if 15 per cent. of our school children are off 20 per cent. in power of development, that lowers the whole power of development of the school children of the state by three per cent.

We expend upon our public education now about two million dollars a year. Three per cent. of two million dollars is sixty thousand dollars.

Are these figures facts? Verify them for yourselves. Sixty thousand dollars of our all too scant educational fund wasted annually—literally devoted to the maintenance of hookworms. Sixty thousand dollars for hookworms, and we haven't taken into account any of the negro population. Sixty thousand dollars' loss, and

we haven't taken into account any children under or over school age. Sixty thousand dollars' loss annually, and we have left out of consideration all the people of the cities and towns with a population of over one thousand, and aggregating 30 per cent. of our entire population.

Remember, now, that sixty thousand dollars represents only a part of the loss from a single disease; and remember that every disease represents a distinct money loss, some greater, some less, but in all cases a loss; and remember that all the loss represented by disease would be saved by curing and by preventing the diseases, and then stop and ask yourself—Don't ask yourself if you can afford to have medical inspection of schools, but ask yourself if you can afford *not to have it.*

The third object to be attained is the education of the public. And this is the most important of the three, for, after all, conservation of the public health is a matter of education pure and simple. What the children are taught to-day represents the greater part of what the men and women of to-morrow will know. And they can never be taught by simply telling them how. They must be shown. It is an aphorism in educational circles that we learn to do by doing. We learn to prevent sickness by putting into operation the measures that will prevent it. We learn to correct physical defects by correcting them. We have had agricultural schools for years, many years, but it was only recently that agriculture was actually introduced into them. The corn clubs of to-day will teach more agriculture in a year than the agricultural school would ever teach without it. It is learning to do by doing. So it is with the public health. If we would conserve it, we must teach our people how, and we must teach them how to do it by doing it.

With this method we don't have to wait till the next generation for results. The children learn now and so do the parents. There is no more effective way of disseminating general sanitary information than through the schools. This, again, the corn clubs have verified. Boys have joined the clubs and have taught the fathers things that they couldn't have been taught in any other way.

The forces employed in medical inspection of schools will of necessity vary according to the density of the population, the available funds, and the spirit of the populace. In the larger cities, where the matter is taken up, as London, New York, Boston,

Glasgow, Frankfort-on-Main, and so on, an adequate corps of physicians and nurses is employed, which, together with provision for dental clinics, constitute a complete system of medical supervision. But smaller places have to be content with less. The nurse may be dispensed with, and in the still smaller, where available funds become an object, the services of the physician and dentist may be placed upon a gratuitous basis. In over 75 cities in the United States having medical inspection of school children, the doctors receive no compensation.

But the most important factor in medical inspection of schools is the teacher. And this is true even where doctors and nurses are available. Not that the teacher does or can displace either the doctor or nurse—that cannot be done, but that the teacher is an indispensable adjunct, and can do much, even where there is neither doctor nor nurse. In London, where the scheme has been developed largely after the ideas of Dr. Kerr, who is probably the foremost thinker of the time along these lines, the greater part of the responsibility for the control of communicable diseases rests upon the teacher. To outline this responsibility a little better, the teachers keep on the alert for cases of communicable disease, and as soon as they suspect a case it is reported to the school physician or nurse, as the case may be. In other words, the teacher doesn't undertake to make a diagnosis of measles or scarlet fever or diphtheria, but does undertake to determine whether a child is sick or well, and if sick it is reported to the doctor. So important a factor is the teacher in medical inspection of schools that even the work of testing the eyes is done by the teacher in Massachusetts, and the results are reported as being satisfactory. Here, again, the teacher does not undertake to make a diagnosis of eye troubles. She only undertakes to determine whether the eyes are normal or defective, and if anything is found to be wrong, the student is referred to an eye specialist at once. There is no attempt on the part of the teacher to do more than determine whether the eyes of the child need examination by an eye specialist.

In this state the teachers have, I might say, unconsciously taken up medical inspection of school children to the extent of suspecting hookworm infection here and there and referring them to the family physician and the State Board of Health, and tuberculosis in school is frequently taken cognizance of by the teacher and advice sought, and the same thing might be said of sore eyes,

and ring worm, and smallpox, so that little by little a system of medical inspection is growing up under the impulse of necessity. In one of the larger schools last year, not the mentally defective, but simply the duller pupils, were all taken from the entire school and put into a single room and managed as an ungraded school, with very satisfactory results.

In this connection it is pertinent that I should outline what experience has taught is the line of least resistance in bringing it to pass.

First of all, legislation authorizing it. In the case of Boards of Health taking it up, they usually have sufficient legislation to insinuate it in.

And fortunately it happens that in this state the educational law is wide enough in its wording and meaning that whenever a school board wants to devote a part of the school fund to looking after the physical needs of the school and school children, it can do it. So that the need for additional legislation is at once disposed of. The existing machinery is all sufficient.

Next is some one to take the initiative. It may be the Womans Club; and there are some forty Womans Clubs in the state federation, and no one knows how many that are not. It might be the Womans School Improvement Association. There are something like 150 such organizations in the state, whose excuse for existence is what the name implies. Or it might be the local Board of Health, as in Jacksonville; or the local board of education, or, indeed, the principal of a school, as in Madison and many other places. It is not practicable for a State Board of Health, or a state board of education, to more than make provision for it—it cannot be executed upon a state-wide scale. Even in Massachusetts, where provision is made for it for the entire state, its institution and execution depend upon the local authorities.

And the same is true in Scotland, Australia, everywhere. The State Board of Health or the state board of education can make provision for it, can make it possible, but the local authorities must bring it to pass.

Summed up, or boiled down, then, any school in the state that wants medical inspection can have it—the thing required is the necessary effort to bring it about.

It is easier to bring it about in the larger places than in the smaller ones, and, other things equal, medical inspection will first

take shape in the larger cities of the state, and from these it will gradually work its way down through the towns of smaller and smaller magnitude. And once it is started there is reason to believe that it will so justify its existence that it will go on down and down, till even the smallest aggregate of pupils will eventually undergo some form of medical inspection.

In like manner the medical inspection will be more thorough in the larger places, certain features being dropped off as the smaller and smaller places are reached, till only the most essential phases will be retained in the smallest aggregates.

And it might with safety be added that as time passes medical inspection will come to be more and more simplified, and pari passu more and more complete in any given community, and at the same time the smaller place will come to be larger, so that the institution will be an ever growing one toward perfection and usefulness.

If I read the signs of the times aright, medical inspection of schools is not only coming, but is already here, and here to stay. It is based upon the eternal principles of progress, and, like the Chinese revolution, is gathering momentum as it goes. At first, disorderly, perhaps, its energies will not always be expended to best advantage; and here and there it will encounter royalists, who do not believe in it; but ever and anon it can point with pride to the things already accomplished that more than justify its existence, as in London, for example, where ringworm was so common that a ringworm school was established, but had to be closed after three years for lack of pupils; as in Bradford where schools are conducted in open air for children of tuberculous tendencies; as in Madison, Fla., where the prevalence of hookworm disease has been reduced during the last eight years to the point where it is all but eradicated.

It is to the eternal credit of the Womans Clubs that they are devoting their energies to such worthy objects. If ever woman suffrage comes to pass, it will be brought about, not by fanatics exhibiting themselves as suffragettes, but by the eloquent, the silent appeal of the good women of the country who demonstrate their ability to discern and to do.

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